

Architectures of Ironic Computation: How videogames offer new protocols for architectural experimentation.

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When we speak of computation in architecture today, we tend to think of it aligned to certain camps sparring for the future of the profession. This might be the promise of digital fabrication practices collapsing relationships between the design and manufacture of architecture. Or it might be the use of particle simulation and 'deep learning' techniques to advance ultra 'hi-resolution' architectural materials and produce unprecedented forms.

Yet much day-to-day use of computation does not engage with this 'cutting edge' at every turn. Social media, targeted advertising metrics and search algorithms have completely changed our everyday culture, and not always for the better. So what if we considered drawing computational approaches from other industries? The modern examples of Adorno's maligned culture industries¹ perhaps?

Videogames now surpass even the colossal commercial weight of Hollywood. Yet there are remarkably few architects interrogating their potential impact on architectural design and practice. This seems strange when we consider that with the development of 3D *game engines* alongside home computers, smartphones and tablets with the power to render their scenes - creating and disseminating virtual architectural spaces has never been more prevalent. Lev Manovich once framed virtual *navigable spaces* as a key innovation of *new media*,² yet games – which push such media forward both artistically and technologically, still seem rather under-examined.

Minecraft (2011) is currently the go-to reference when discussing videogames and architectural creation, understandably given how its 'sandbox' system affords players considerable agency to create structures. Yet there are other examples. When Rockstar Games recreated Los Angeles into the metropolis of *Los Santos* for *Grand Theft Auto V* (2013), it was surely one of the largest projects to archive the architectural landscape of a city as part of an (estimated) \$137m development cost. We might cite the legal relationship between French copyright of historic structures and the facsimile of the Notre Dame in *Assassin's Creed: Unity* (2014): virtual modulations of a real building required by both law of the land and *law of the game*. Or we might discuss the increasingly blurred lines between game interfaces used in entertainment and those utilised in military robotics and UAVs, exploiting the dexterity today's young soldiers possess in navigating virtual spaces using a gamepad in order to regulate and control physical space.

Why then, are we not speaking about games more and welcoming them into the expanded field of architecture? Might it be that as *games*, they challenge a longstanding positivist relationship between architecture and technology? Or because of their often questionable subject matter? Or is it because their formal compositions privilege paradox, irony and 'disunity'³ which seem like architectural themes from another time? The fact that multiple discussions on the subject (Galloway, Kirkpatrick, Wark et al.) have identified videogames as *allegorical* structures means that we might need to see them as media using computation for different aims and motives than those many technological evangelists of architecture promote.

Forms of Failure

In a 2015 piece for *The Atlantic*, videogame theorist Ian Bogost bemoaned the quasi-theocratic framing of the algorithm in contemporary culture. Bogost was concerned by how Google, Facebook or Apple 'invite' us into their idea of society smoothed and solved by data and the algorithm. For Bogost, such rhetoric ignores both necessary relationships to the muddle of physical reality *and* the fact that algorithms are representations of more complex source systems designed by people. He calls them *caricatures*.⁴ Videogames, he posits, are the only form of algorithm that publicly embraces this caricature nature. For Bogost,

videogames admit what they are: *rule-based representations*⁵. As it is, most videogames do not have the pretension to change or save the world, but instead to uphold a temporary set of rules for one to engage with and succeed (or fail) against.

Compared to advanced manufacturing, smart cities or environmental parametrics, games might appear as folly. As Graeme Kirkpatrick states, 'all video games are a kind of opening up of the machine and begin the process of prising it away from the dominant historical narrative of 'technological progress''.⁶ Of course games often do utilise cutting edge technologies in their production. Yet at the same time as big releases, smaller experimental *indie* games are pulling the medium in different directions. These games all share a *videogame aesthetic*. For Jesper Juul, the videogame is the sole artform that specifically deals with *failure*. As we explore the rules and limits of games, and try to succeed against them, we fail multiple times. Space within videogames becomes the location for experiments in failure:

'Video games are the *art of failure*, the singular art form that sets us up for failure and allows us to experience and experiment with failure.'⁷

Games provide situations and spaces within which to fail, and architectures represented within flit between supporting and mitigating failure. Never mind the near-photorealistic ledges and precipices of an *Assassin's Creed* game, going back to late 80's *Mario* one would jump between platforms – two 'built' elements sandwiching a gap. The platforms *require* the gap - the zone of failure between them in order to quantify success. These represented landscapes were first drawn on graph by designer Shigeru Miyamoto, closely resembling an architectural section.⁸ In *Super Mario Maker* (2015) such elements can now be arranged by users into novel combinations, producing levels that push at the edge of the logics of the game.

The dispersal of symbolic components creates the architectural logic of the game world. Of course, the fragmentation of symbols is not new to architectural theory. Robert Venturi, for instance, has discussed the notion of *inflected* elements in architecture – fragments that hint at an overall whole without explicitly disclosing it.⁹ As Emmanuel Petit argues, 'instead of providing the literal continuity of a work's meaning, inflection *implied* a formal continuity, which unfolded through time.'¹⁰ In a *Mario* game, architectural fragments work towards the 'whole' of the videogame form by supporting this relationship between progression and failure. As it is, these fragments define Mario's landscape through inflection, emerging over the course of the game. The architecture we experience in games is usually the facilitator of a very specific type of action enmeshed into the architectural design - whether it is trying to evoke 15th century Venice or near-future New York.

Videogames are computational media that utilise algorithms to regulate rules. But as Wark and Galloway point out – they are also *allegorical*. However, experiencing the 'unique disunity'¹¹ of videogame space is not the same as reading a book about architecture or watching a film containing buildings. Galloway and Wark have attempted to outline the effect of games through the portmanteau *algorithim*.¹² This layered experience, the intuitive surface layer of the game and the underlying coded structure, work together to produce affect. As Wark states:

'What is distinctive about games is that they produce for the gamer an intuitive relation to the algorithm. The intuitive experience and the organizing algorithm together are an *algorithim* for a future that in gamespace is forever promised but never comes to pass.'¹³ (In this context Wark refers to 'reality' as *gamespace*)

If the *algorithim* might be harnessed as a formal structure unique to games, could architects use it? Game spaces combine both contemporary coding systems *and* tools of architectural, photographic and cinematic representation. Architects would surely use videogames as a medium differently to commercial game designers, much as architectural flythroughs are different to feature films or soap operas.

I believe that looking towards the videogame form reveals formal techniques that I would call *ironic computation*. They are ironic because they deliberately and strategically sever and reassemble symbolic links through the logics of the game code, the screen, the controller and

so forth. The enmeshing of ludic rules into spatial representations means videogames and their encapsulated universes might become a computational medium for *thinking about architecture* rather than generating it, prototyping it or manufacturing it.

As Wark says 'while other media present the world as if it were for you to look at, the game engine presents worlds as if they were not just for you to look at but for you to act upon in a way that is given.'¹⁴

Enshrined in the lowbrow satirical environment of *Grand Theft Auto V*, we might find Martino Stierli's definition of Venturi and Scott-Brown's 'vulgar gaze'¹⁵ – an architectural elevation of unrefined culture. Or the infinite procedural planetary systems of *No Man's Sky* might evoke Piranesi: 'I believe that if I were commissioned to design a new universe, I would be mad enough to undertake it.'¹⁶

Towards Ironic Computation

Videogames might open new paths into digitality and its relationships to architecture. Through computation they present symbolic paradoxes to the player. The first irony of videogame structure is that good code should disappear - feats of algorithmic dexterity by developers are created in order to maintain an experience that 'flows' for the player. Or as Juul discusses, success against game rules might not mean narrative success.¹⁷ As Kirkpatrick suggests, gamers do not suspend disbelief of the formal contradictions of the videogame, in fact those paradoxes are collapsed into the essence of the videogame form itself.

The *ironic computation* of the videogame means that even when we are traversing realistic-looking environments, the rules of engagement with the world and its symbolic values are a free floating structure where architectural meaning can coalesce and distribute around the player.

Take the post-pandemic world of *The Last of Us* (*TLoU*, 2013). Within the game - experienced from a floating camera behind the protagonist - we might die many times over the course of the narrative. Despite this, *TLoU* was still held up as a high-watermark of storytelling in games, with the formal contradictions (mostly) taken as a given of the medium. These paradoxes extend into the architectural landscape presented in the game and the logics that underpin it. In scenes of detritus players find bricks and bottles marked with a subtle glow, which can be thrown to distract infected humans and proceed through levels. Under the logics of the game, the symbolic value of certain empty beer bottles or bricks in a pile of rubble becomes deviated from trash to intrinsic object of survival. Yet in the underlying game logic it is simply an object producing a collision with another object to change the behaviour state of a further object.

The bottle becomes part of a layered, ironic topology where multiple meanings exist at once. It becomes allegorical – its position in the logic of the game changes its meaning: 'the allegorical meaning supplants an antecedent one.'¹⁸ The augmenting or supplanting of meaning in depictions of space is fundamental to videogames.

In games, repetition and disunity often present themselves as the overriding form, despite the encapsulated nature of their worlds. For Kirkpatrick, dying in games 'causes a breakdown in the seamless experience of form. But, paradoxically, the recurrence of such a breakdown is what discloses its character as *form*.'¹⁹ Death is a synonym for failure in general. In other words, the repeated rupture of a seamless experience of form *is the videogame form itself*.

Rupture and disconnection as form frames the world of *The Last of Us* as an ironic territory. The game world is structured around irony - deliberately contradictory meanings between the fiction of the game and its mechanics. The structure of the game world elevates the 'trash' bottle into an object of extreme value, both visually within space and in defining one's ability to traverse space. Ironic detachment is intrinsic to the often contradictory logics of game worlds – operating as new apparatuses where meaning becomes fluid. As Kirkpatrick states:

'Video games offer us experiences in which simulacra proliferate, we engage with objects that are never quite what they seem but which, nevertheless do afford us experiences that are coherent on their own terms, that is, as video game objects. Form here is in a play with semblance. The video game object has to appear to be something else, without actually performing the representational function of standing for any one thing.'²⁰

Bottles and bricks in *The Last of Us* appear confused, a state that we might comprehend through Espen Aarseth's definition of the *cybernetic sign*. To encounter a beer bottle in reality - to understand it as a container and an object to drink from, is in Aarseth's terms, *trivial*.²¹ He argues there is some implicit connection, a domination of the material authority of the glass bottle over the act of drinking from it. Yet, with the digital bottle 'the relationship might be termed *arbitrary*, because the internal, coded level can only be fully experienced by way of the external expressive level.'²² We intuit the logics of the bottle by the way the game responds through its display onscreen, not through revealing its deep coded structure. Likewise, the programmer creating code for the behaviour of the bottle could only judge its success by running the game itself and seeing its onscreen behaviour.

Without a material constituent, the link between the represented world and the logical structure is arbitrary. As gamers, our experience of symbolic objects being 'telegraphed' to us means that the golden sheen of the bottle connotes significance. But this signification relationship could be anything. Or it could be changed at a moment's notice by inputting a cheat code. Under this paradoxical existence, videogames become ironic structures, and the virtual spaces they present to us become the *architectures of ironic computation*.

Mind the Gaps

Using Michael Nitsche's definition of the five *conceptual planes* for analysing videogame space²³, such ironic interplay takes place between the *rule based space* and the *mediated space* of the game, firstly as the underlying rules and secondly as the 'space of the image plane' presented to the gamer. Muddying the waters is the relationship of the game to the *fictional space*, which Nitsche defines as the imagined space produced in the mind of the player by their relationship to the *mediated space*. The mediated space collapses diegetic and non-diegetic images - the represented fictional world versus the rules, *graphic user interfaces* and *heads-up displays* which give us information about our status within that world's ludic structure. Numbers tell us resources are running low and so we need to send more workers to a mineral node, or we make evasive manoeuvres across a freeway to lose the cops and lower our *wanted level*.

From here relationships become even more opaque. We might imagine ourselves within a consistent world such as indie developer Strangethink's *Secret Habitat* – 'a procedurally generated island with 99 procedurally generated art galleries full of generated artwork and generated sound loop exhibits.'²⁴ But the mediated space of *Secret Habitat* is totally subservient to rules – art galleries, the artworks within them and even their names are all procedurally generated together, ironically detaching the gallery-artwork relationship we might perceive in the *fictional space*.

On the fourth of Nitsche's planes, the *play space* – 'of play and hardware interface,' this amounts to using the WASD keys on a keyboard to move our character, using the mouse to look around us and other keys to interact with the world. From the level of the material world of hardware and peripherals, our actions connect back to the *rule based space* of underlying code in order to produce the *mediated space* that then becomes our *imaginary space*. Once we arrive at Strangethink's improbable architectures and landscapes viewed through screens, navigated through a hand-operated controller interface, Aarseth's *arbitrary* relationships of the cybernetic sign re-emerges. Because, as Kirkpatrick points out: 'with video games the ironic distance, or gap, between what the player is doing (with the controller) and what the screen is representing is ineliminable.'²⁵

It is interesting comparing videogames to what is loosely termed *interactive architecture*. Such practices increasingly adopt game interfaces utilising body tracking such as Microsoft's *Kinect*. Yet the *Kinect* has been phased out since the release of the last Xbox console.²⁶ If architects are exploring the possibilities of these tracking systems, then gamers are leaving them behind. Perhaps the connection between movement and application onscreen seems too direct, too limited, despite the many different gestures a human body can perform.

In gamer culture perhaps the prevalence of abstracted hand operated interfaces demonstrates this overriding presence and pleasure of 'ironic distance.'²⁷ Many diverse types of games, played from various viewpoints, in different virtual spaces of varied notional scales utilise the same control equipment. For an architect, this suggests lively possibilities for exploiting this gap –not only using game techniques to make virtual architectures, but defining the interfaces that predicate certain types of behaviour within those architectures. Recalling Tschumi – 'architecture is defined by the actions it witnesses as much as by the enclosure of its walls.'²⁸

Procedural irony and the British Countryside Generator

Manovich draws a distinction between the use of procedural techniques in architecture to create complex forms and abstract spatial structures to game designers utilising similar techniques to create realistic 3D environments.²⁹ The difference Manovich identifies is between the novel form and novel composition of symbolic 'realistic' fragments in a world. Of course, as Aarseth reminds us, these environments deviate from reality in order to become playable.³⁰ Procedural techniques in videogames - which often work towards the imposition of fictional values and rules onto a facsimile of reality - present an alternate practice for digital architecture, one that might be conceptual and ironic in its definition of spatial relationships rather than pursuing physically novel forms.

The 2014 game *Sir, You Are Being Hunted* by Big Robot, utilised a procedural *British Countryside Generator* to create its game worlds.³¹ Each playthrough takes place in a randomly generated rolling landscape of fields, hedgerows, hamlets and farms. As developer Tom Betts explains, they utilised mathematical techniques such as voronoi distribution in order to evoke the carpet of fields that covers the countryside of United Kingdom. The *Generator* also distributes hedgerows, plants, cottages and generates randomised village names. In this case *Sir* generates its 3D environment through an algorithmic system that generates an ironic, parochial version of 'Britishness'. It recalls MVRDV's *Glass Farm* project, where an 'average façade composition' of local farmhouses was projected onto a glazed barn-sized building - fragments *inflected* through vernacular coalescing into an architectural structure. Or Tschumi again - the *Parc de la Villette* with its system of dispersed symbolic 'points' within a field of lines and spatial divides.

This algorithm of *Sir* is responsible for distributing the allegorical landscape: 'Allegorical imagery is appropriated imagery; the allegorist does not invent images but confiscates them.'³² The procedural is used to distribute symbolic and pictorial elements. The environment of *Sir* becomes a space for the conceptual recreation of an impossible Britain, distributed across a *tabula rasa* upon starting each new game. As an *allegorithm*, one could easily imagine such a system being utilised for political means, to reinforce certain (architectural) stereotypes through the encoded values of the game. As *ironic computation*, the selection and distribution of a fragmented 'Britishness' becomes a spatial, procedural critique of identity as well as a navigable virtual space.

Grand Theft Auto as Banham's id

Continuing to think about games that allow us to explore characterisations of real spaces we can further expose the architectural agency of the algorithm. Consider the city of Los Santos, the metropolis that underpins *Grand Theft Auto V*. The developers *Rockstar* have gone to great pains to produce a city that has the intuitive experience of being in, driving through, walking along or flying above *Los Angeles*. This takes place in a virtual city that is

compressed into a much smaller version of that sprawling metropolis that the player encounters as a series of contiguous recognisable areas that might be a number of miles apart in reality.

In Wark's terms, the game's fiction 'is just another type of interface'³³ – that inscribes the real within it when we look into the file structure of the Los Santos game world. A model of the fictional in-game strip club *Hornbills*, sited on 'West Eclipse Boulevard' bears the filename *ss01_07_bdyshopstr.ydr*, betraying its real inspiration – the Sunset Strip's *Bodyshop* (possessing a sign brought to fame by Mötley Crüe's *Girls, Girls, Girls*).

In *GTA V* one presses a single button to perform the automated action of dragging a driver out of their car or smashing the window of a parked vehicle in order to steal it. *GTA*'s cities have always embraced this fluidity, turning the physical act of jumping from vehicle to vehicle into a simple button press. If Reyner Banham had to put his love for LA into words, celebrating landscapes where 'mobility outweighs monumentality',³⁴ in *GTA* the organising algorithm of the game facilitates this zone of continuous momentum as we *play it*. Los Santos is a virtual manifestation of an automobile fetish not only through its uncanny visual resemblance to LA, but also through an algorithm that turns the car, and all cars, into objects to maintain a fluid movement across the landscape.

We are not necessarily *told* how explicitly important being able to rapidly transfer from one vehicle to another is, we learn this by playing the game. As Kirkpatrick points out, the button press to carjack is totally arbitrary – it could be any command. But far from diminishing its importance, the banality of this act as compared to the dextrous hand movements simply to move or look around is striking. The dual-stick control system for the player has at least *some* formal relationship to human locomotion and the movement of a head. The interchange between vehicles, and thus the possibility to continue to flow through the simulated city is so *important* in the logics of *GTA* that it is utterly trivialised into one button press. The clue is in the name: *Grand Theft Auto*. In the city of Los Santos, the most ironically detached act is also its ontological underpinning.

Symbolically the cars are still designed to look like and sound like cars, but their allegorical existence is layered. Beneath the dubious 'satire' of its storyline, and the impressive visual likeness to reality, the mechanics of *GTA* embody *fetish* for LA and the dream of a landscape – a *megatexture* ordered by the automobile. While Banham had to write of LA, Rockstar can *enmesh us* in adoration inside the algorithm space. We experience Los Santos as a Los Angeles mediated through these terms. Underneath the sardonic surface presentation of a virtual LA sits the procedural heart of a game that elevates the car into an *ethic*. Of course this relationship between car and controller also recalls Banham's *Great Gizmo*, of space mediated and 'captured' by mass-produced gadgets, this time virtually.

We might criticise *GTA* for the conservatism of its satire as an allegorical story, but as an *algorithm*, this game becomes a form of *ur-LA*. Within it lies a kernel of Banham's spirit. What this suggests for architects is the possibility to insert logics, even into representations of existing buildings and places to open up sites for experimentation and speculation. Games offer us the opportunity to encode ideology and argument into the logics of virtual worlds that can reinforce ways of thinking about cities and their architecture by exploiting the ironic distance of the player at the controller.

Architectures of Ironic Computation

Contemporary videogames, built on 3D game engines, offer us templates for architectural exploration. Simply put, I believe their ironies, exploiting dissonance between representations of worlds and the laws by which we can interact with them, has a rich potential for thinking about architecture. If a Piranesi or Hejduk could use the drawing as an allegory space, then we could see games utilised as *algorithm spaces*: virtual, navigable sites for thinking about architecture. If Venturi and Scott-Brown or Banham used diagrams, sketches and text to peel apart and play with architectural meaning as a strategy, games do this as a matter of course. They are sites where rules and experiences are collapsed into one.

In the examples above, I have attempted to outline ways in which a series of games contribute to architectural discourse by the manner they deviate space and sever symbolism. Of course, these games were not primarily made to make architectural arguments; they are pop-cultural artefacts, pieces of entertainment. Yet they still offer ways of discussing computation and architecture in very different terms. Far from signalling the death of drawing and traditional representation through the proliferation of computers, games usually involve the composition of elements created by both programmers *and* artists – their rich, pictorial worlds become a key selling point. If architectural computation can sometimes be seen as a new wave of technological determinism, games offer a wilfully ironic alternative future for designers. A future where computers make meanings oscillate, symbolic relationships are turned on their heads and the ontologies of space can wobble like an overthumbed analog stick on the gamepad of architecture.

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- ¹ Theodore W. Adorno and Max Horkheimer, *Dialectics of Enlightenment* (London, New York: Verso, 1997), p.121
- ² Lev Manovich, *The Language of New Media* (Cambridge MA, London: MIT Press, 2001), p.252
- ³ Graeme Kirkpatrick, *Aesthetic Theory and the Videogame*, (Manchester: Manchester University Press, 2011), p.112
- ⁴ Ian Bogost, "The Cathedral of Computation", accessed 30/01/16, <http://www.theatlantic.com/technology/archive/2015/01/the-cathedral-of-computation/384300/>
- ⁵ Ian Bogost, *Persuasive Games* (Cambridge MA, London: MIT Press, 2007), Kindle edition for iPad, Loc 84.
- ⁶ Graeme Kirkpatrick, *Aesthetic Theory and the Videogame*, p.115
- ⁷ Jesper Juul, *The Art of Failure: An Essay on the Pain of Playing Video Games* (Cambridge MA, London: MIT Press, 2013), p.30
- ⁸ Patricia Hernandez, "The Way Nintendo Used To Make Mario Levels", accessed 20/01/16, <http://kotaku.com/the-way-nintendo-used-to-make-mario-levels-1711701916>
- ⁹ Robert Venturi, *Complexity and Contradiction in Architecture* (New York: The Museum of Modern Art, 2011) p.88
- ¹⁰ Emmanuel Petit, *Irony or, the Self-Critical Opacity of Postmodern Architecture* (New Haven, London: Yale University Press, 2013) p.54
- ¹¹ Graeme Kirkpatrick, *Aesthetic Theory and the Videogame*, p.112
- ¹² Alexander R. Galloway, *The Interface Effect*, (Cambridge UK, Malden MA: Polity Press, 2012)
- ¹³ McKenzie Wark, *Gamer Theory*, location 30
- ¹⁴ McKenzie Wark, *Gamer Theory* (Cambridge MA, London: Harvard University Press, 2007), location 199.
- ¹⁵ Martino Stierli, *Las Vegas in the Rearview Mirror: The City in Theory, Photography, and Film* (Los Angeles: Getty Research Institute, 2013) p.273
- ¹⁶ The Met Museum, "Giovanni Battista Piranesi (1720–1778)", accessed 08/02/16, http://www.metmuseum.org/toah/hd/pira/hd_pira.htm
- ¹⁷ Jesper Juul, *The Art of Failure: An Essay on the Pain of Playing Video Games* (Cambridge MA, London: MIT Press, 2013), p.31
- ¹⁸ Craig Owens, "The Allegorical Impulse: Towards a Theory of Postmodernism", *October*, Vol.12 (Spring, 1980), p.69
- ¹⁹ Graeme Kirkpatrick, *Aesthetic Theory and the Videogame*, p.110-111
- ²⁰ Ibid., p.72
- ²¹ Espen Aarseth, *The Cybertext Reader* (Baltimore, London: The John Hopkins University Press, 1997) p.40
- ²² Ibid.,
- ²³ Michael Nitsche, *Video Game Spaces: Image, Play, and Structure in 3D Worlds* (Cambridge MA, London: MIT Press, 2008), p.15-16
- ²⁴ Strangethink, "Secret Habitat", accessed 05/02/16, <https://strangethink.itch.io/secret-habitat>
- ²⁵ Graeme Kirkpatrick, *Aesthetic Theory and the Videogame*, p.73
- ²⁶ Matt Weinberger, "The downfall of Kinect: Why Microsoft gave up on its most promising product", accessed 10/02/16, <http://uk.businessinsider.com/why-microsoft-xbox-kinect-didnt-take-off-2015-9?r=US&IR=T>
- ²⁷ Graeme Kirkpatrick, *Aesthetic Theory and the Videogame*, p.73
- ²⁸ Bernard Tschumi, "Advertisements for Architecture" accessed 15/02/16, <http://www.tschumi.com/projects/19/#>
- ²⁹ Lev Manovich, *Software Takes Command* (New York, London: Bloomsbury, 2013) p.
- ³⁰ Espen Aarseth, "Allegories of Space. The Question of Spatiality in Computer Games", *Cybertext Yearbook 2000*, p.169.

³¹ Big Robot, "If I May Speak Procedurally, Sir: Building The British Countryside Generator", accessed 15/12/15, <http://www.big-robot.com/2012/07/02/procedural-british-countryside-generation/>

³² Craig Owens, "The Allegorical Impulse: Towards a Theory of Postmodernism", *October*, Vol.12 (Spring, 1980),

³³ McKenzie Wark, *Gamer Theory*, location 148

³⁴ Reyner Banham, Los Angeles: The Architecture of Four Ecologies (Berkeley and Los Angeles: University of California Press, 2009), p.5